The ToxGuide™ is developed to be used as a pocket guide. Tear off at perforation and fold along lines.

Sources of Exposure

General Populations

- The highest exposure levels for the general population result from contact with consumer products containing xylenes. Very small amounts of xylenes are also present in cigarette smoke.
- Exposure may rise from ingestion of contaminated drinking water, painting, pumping gasoline, scale model building, using cleaning solvents, lacquers, and paint thinners/removers.
- People who work or live near industrial settings may receive a higher exposure to xylenes.
- Small amounts of xylene are commonly found in indoor air.

Occupational Populations

- Based on the available case reports of xylene toxicity in humans, painters (or paint industry workers), and laboratory workers appear to be most frequently affected.
- Workers involved in distillation and purification of xylene, employed in industries using xylene as a raw material, or employed in the petroleum industry, may be at higher risk of exposure.
- Increased exposures have been observed for wood processing plant workers, painters, gas station employees, metal workers, and furniture refinishers.

Toxicokinetics and Normal Human Levels

Toxicokinetics

- Studies in humans and animals have shown that xylenes are well absorbed by the inhalation and oral routes.
- Approximately 60% of inspired xylene is retained and approximately 90% of ingested xylene is absorbed.

Normal Human Levels

No data available.

Biomarkers / Environmental Levels

Biomarkers

- Measurement of blood levels of xylene is limited by the rapid metabolism of xylene.
- There are no data on background concentrations of xylene in blood or urine.
- Detection of methylhippuric acid in the urine is the most widely used indicator of xylene exposure, but measures of this metabolite are only valid soon after exposures.

Environmental Levels

Air

- Typical levels of xylene measured in indoor air range from 1 to 10 ppb.
- Typical concentrations in outdoor air range from 1 to 30 ppb.

Sediment and Soil

- No data are available on actual measurements of xylene in soil.

Water

- Half-lives in groundwater range from 25-287 days, depending on temperature and other factors.

Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2005. Toxicological Profile for Xylenes (Draft for Public Comment). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Services.

ToxGuide™ for Xylenes

C_8H_{10}

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U.S. Department of Health and Human Services
Public Health Service
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ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

Chemical and Physical Information

Xylene is a liquid

- Xylene is a colorless, flammable liquid with a somewhat sweet ordor.
- Xylene evaporates and burns easily.
- Xylene does not mix well with water; however it does mix with alcohol and many other chemicals.
- Xylene occurs naturally in petroleum and coal tar and is formed during forest fires.
- Chemical industries produce xylene from petroleum.
- Xylenes are a component of gasoline.
- Xylenes are used as industrial solvents (can dissolve other substances) in printing, rubber, and leather industries.
- Xylenes are effective removers of paints, greases, and other organic compounds.

Routes of Exposure

- Inhalation (breathing) - appears to be the major route of exposure.
- Ingestion (eating or drinking) - exposure through the consumption of xylene contaminated groundwater (cooking, laundering and bathing), can also result in inhalation exposure to xylenes.

Xylene in the Environment

- Xylenes are released to the atmosphere primarily as fugitive emissions from industrial sources (e.g., petroleum refineries, chemical plants), in automobile exhaust, and through volatilization from their use as solvents.
- Discharges into waterways and spills on land result primarily from use, storage, and transport of petroleum products and waste disposal.
- When released to soil or surface water, xylene volatilizes into the atmosphere, where they are quickly degraded.
- Xylene that does not volatilize quickly may undergo biodegradation in the soil or water.
- Xylene may also leach into groundwater, where degredation by microbes becomes the primary removal process.

Relevance to Public Health (Health Effects)

Health effects are determined by the dose (how much), the duration (how long), and the route of exposure.

Minimal Risk Levels (MRLs)

Inhalation
Mixed Xylenes

- An MRL of 1.5 ppm in air has been derived for acute duration inhalation exposure (≤ 14 days).
- An MRL of 0.5 ppm in air has been derived for intermediate-duration inhalation exposure (15-364 days).
- An MRL of 0.05 ppm in air has been derived for chronic inhalation exposure (≥ 365 days).

Oral
Mixed Xylenes

- An MRL of 1 mg/kg/day has been derived for acute-duration oral exposure (≤ 14 days).
- An MRL of 0.5 mg/kg/day has been derived for intermediate-duration oral exposure (15-364 days).
- An MRL of 0.2 mg/kg/day has been derived for chronic oral exposure (≥ 365 days).

Health Effects

Respiratory

- Nose, eye and throat irritation.
- Inhalation of xylene vapors can also result in neurologic symptoms similar to alcohol intoxication.

Gastrointestinal

- Symptoms of nausea, vomiting, and gastrointestinal discomfort have been noted in workers exposed to xylene vapors. Symptoms subsided after cessation of the xylene exposure.

Hepatic

- Acute-duration exposure to high levels of xylene may result in hepatic (liver) toxicity.

Children's Health

- Children might be exposed to xylenes by inhaling fumes of gaoline or of paints or other products containing xylene as a solvent.
- In small children, more rapid breathing rates may result in increased inhalation exposure.
- Children, because of their narrower airways would be more sensitive to swelling effects, and may be more sensitive to acute inhalation exposure than adults.

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